

 <p>STANDARD</p> <p>Security Metadata Universal and Local Sets for Digital Motion Imagery</p>	<p>MISB ST 0102.11</p> <p>23 October 2014</p>
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1 Scope

This Standard describes the use of security metadata in MISP compliant digital Motion Imagery applications. It is mandatory for national security applications that each part of a Motion Imagery file be marked correctly and consistently with security classification and other security administration information. The approved practices in this Standard are mandatory for all MISP-compliant digital Motion Imagery implementations using KLV encoded security metadata. Security metadata is to be provided with all MISP compliant digital Motion Imagery streams and files. Furthermore, security metadata is to be linked to all essence types (Motion Imagery, audio, data) and/or metadata associated with MISP compliant digital Motion Imagery streams and files.

This Standard defines the KLV encoding of embedded security metadata in MPEG-2 transport streams (MPEG-2 TS) or files and MXF-based files. Other encodings (non-KLV) of the security metadata and/or application of the security metadata to other file and transport formats (non-MPEG-2 TS or MXF-based) are outside of the scope of this Standard. Future MISB Standards may define these encodings and applications, but the semantic content of the security metadata will remain the same and be governed by this Standard.

The methods used to gather security information, create streams or files and insert security metadata into these transports are the responsibility of application system developers in concert with appropriate Security officials. Similarly, the proper display of security information on screens, computer displays, printed output, etc. is the responsibility of system application developers. Originators and application users are responsible for the proper handling, and ultimately, for the use and disposition of classified information. This Standard is not a Security manual or instruction on when or how to use security markings or caveats. Use of this Standard does not ensure Motion Imagery systems can or will be accredited by Security officials.

This Standard was, previous to version 0102.5, a Recommended Practice (RP). Earlier versions of this Standard are still referred to as RP 0102.x in this document.

2 References

2.1 Normative References

The following references and the references contained therein are normative.

Note: References [1] [2] are subject to being superseded by ODNI ICDs.

- [1] DNI, Controlled Access Program Coordination Office (CAPCO), (U) Intelligence Community Authorized Classification and Control Markings Register and Manual Volume 5, Edition 1 (Ver 5.1), 30 December 2011
- [2] Director of Central Intelligence Directive (DCID) 6/3, Security Requirements for Interconnected Information Systems, 24 May 2000
- [3] DOD Manual 5200.01 Volume 1, DoD Information Security Program: Overview, Classification, and Declassification, 24 Feb 2012
- [4] DOD Manual 5200.01 Volume 2, DoD Information Security Program: Marking of Classified Information, 19 Mar 2013
- [5] DOD Manual 5200.01 Volume 3, DoD Information Security Program: Protection of Classified Information, 19 Mar 2013
- [6] DOD Manual 5200.01 Volume 4, DoD Information Security Program: Controlled Unclassified Information (CUI), 24 Feb 2012
- [7] SMPTE ST 336:2007, Data Encoding Protocol Using Key-Length-Value
- [8] SMPTE ST 330:2011, Unique Material Identifier (UMID)
- [9] SMPTE RP 210v13:2012, Metadata Element Dictionary. Updated at <http://www.smptra.org>
- [10] MISB ST 0807.14, MISB KLV Metadata Dictionary, Oct 2014
- [11] ISO/IEC 13818-1:2013 Information Technology – Generic coding of moving pictures and associated audio information: Systems (MPEG-2 Systems)
- [12] ISO 3166-1:2006, Codes for the representation of names of countries and their subdivisions – Part 1: Country Codes
- [13] ISO 3166-2:2007, Codes for the representation of names of countries and their subdivisions – Part 2: Country Subdivision Codes
- [14] Federal Information Processing Standards (FIPS) Publication 10-4, Countries, Dependencies, Areas of Special Sovereignty, and Their Principal Administrative Divisions, National Institute of Standards and Technology, Apr 1995 (through Change Notice 10, 23 Mar 2006)
NOTE: Per Federal Register 73/170 (p. 51276), dated September 2, 2008, FIPS 10-4 is deprecated and may no longer be used to assign country codes to data created after 31 December 2012. Support for FIPS 10-4 will be retained in this Standard for legacy data.
- [15] NGA.STND.0033_2.0 | GENC Edition 2.0, Geopolitical Entities, Names, and Codes (GENC) Standard, 30 Jun 2013
- [16] Memorandum for Department of Defense Executive Agent for Information Technology Standards, Subject: Mandating the Use of Country Code Standards within the Department of Defense, 23 Jan 2013
- [17] MISB ST 0107.2, Bit and Byte Order for Metadata in Motion Imagery Files and Streams, Feb 2014
- [18] STANAG 1059 Ed 8, Letter Codes for Geographical Entities, 19 Feb 2004
- [19] SMPTE ST 377-1:2011 Material Exchange Format (MXF) – File Format Specification
- [20] MISB ST 1402, MPEG-2 Transport of Compressed Motion Imagery and Metadata, Feb 2014
- [21] ISO/IEC 646:1991, Information Technology – ISO 7-bit coded Character Set for Information Interchange, 1991
- [22] RFC 2781, UTF-16, an encoding of ISO 10646, Feb 2000

[23] SMPTE ST 335:2012, Metadata Element Dictionary Structure

2.2 Informative References

- [24] Director of Central Intelligence Directive (DCID)1/7, 30 Jun 1998
- [25] DOD Directive (ASD (NII)), Sharing Data, Information, and Information Technology (IT) Services in the Department of Defense, Number 8320.2, 5 Aug 2013
- [26] DOD Net-centric Data Strategy, 9 May 2003
- [27] DOD Discovery Metadata Specification (DDMS), Version 4.1, 12 Jun 2012
- [28] Executive Order (EO) 13526 – Classified National Security Information, 29 Dec 2009
- [29] DOD Directive 5100.55, United States Authority for North Atlantic Treaty Organization Affairs (USSAN), 27 Feb 2006
- [30] DOD Instruction, Number 3115.15, Geospatial Intelligence (GEOINT), 6 Dec 2011
- [31] Imagery Policy Series, Particular Section 6, National Airborne Reconnaissance Imagery
- [32] STANAG 3768 Guide to Security Classification of Air Reconnaissance Imagery, 2005
- [33] Executive Order (EO) 12333 – United States Intelligence Activities, 4 Dec 1981, as amended by Executive Orders 13284 (2003), 13355 (2004) and 13470 (2008).

3 Terms, Acronyms and Definitions

CAPCO	Controlled Access Program Coordination Office
DCID	Director of Central Intelligence Directive
ES	Elementary Stream
FIPS	Federal Information Processing Standard
ICD	Intelligence Community Directive
IEC	International Electrotechnical Commission
ISO	International Organization for Standardization
KLV	Key Length Value
LS	Local Set
MISB	Motion Imagery Standards Board
MPEG	Moving Picture Expert Group
ODNI	Office of the Director of National Intelligence
PS	Program Stream
RP	Recommended Practices
SCI	Sensitive Compartmented Information
SMPTE	Society of Motion Picture and Television Engineers
STANAG	STANdardization AGreement
TS	Transport Stream
US	Universal Set
UMID	Unique Material IDentifier
UUID	Universally Unique IDentifier

Current system

A system currently under an acquisition or block upgrade process as of the date of this document.

Legacy system

A system in Operations and/or Maintenance as of the date of this document.

MISP compliant

The ability of an implementation to create, output and/or accept Motion Imagery streams/files and recognize the component parts according to the requirements as specified the MISP.

4 Revision History

Revision	Date	Notes
ST 0102.11	10/23/2014	<ul style="list-style-type: none"> Clarified Release Instructions per new Requirements ST 0102.11-63 & ST 0102.11-64 and deprecated ST 0102.10-18, ST 0102.10-19, & ST 0102.10-20 Updated Table 1 & Table 2 to leverage SMPTE ST 335:2012 regarding Default Lengths being “<i>stated</i>” versus “<i>normative</i>”

5 Introduction

This Standard defines the content and application of both a Security Metadata Universal Set and Local Set in digital Motion Imagery. The following section explains the individual elements in KLV Sets normative in the SMPTE Metadata Dictionary [10] and the MISB KLV Metadata Dictionary [11]. The construction of both a Security Metadata Universal Set and Local Set from these elements follows SMPTE ST 336 [7] using the KLV metadata encoding protocol. Section 6.10 discusses the new GENC Standard [15] and its impact upon new UAS systems within the United States. *Usage of the GENC standard may break backwards compatibility with older (legacy) exploitation systems based on FIPS Publication 10-4[14].* Unfortunately, this is unavoidable. The DoD Executive Agent for Information Technology Standards has mandated the use of GENC within the USDOD effective January 2013. With the advent of the GENC standard, requirements and recommended practices are discussed for interacting with coalition partners and legacy systems. Finally, this Standard defines how the Security Metadata Sets are used for tagging essence and other metadata sets in MPEG-2 streams and files.

6 Security Metadata Universal and Local Sets for Digital Motion Imagery

This Standard and all of the requirements described herein applies to all MISP compliant digital Motion Imagery in an MPEG-2 transport stream or MPEG-2 transport stream file. Future documents may describe the inclusion of security metadata within other transport mechanisms and file formats. The semantic content of security metadata, however, will not change based on

transport or file format type. The semantic content of security metadata will be governed by this Standard. In the requirements detailed in the remainder of this document, reference to a particular component of a MISP compliant digital Motion Imagery stream or file may be made. This may be for brevity, or to more accurately specify a portion of a MISP compliant digital Motion Imagery stream or file which the requirement applies.

Requirement	
ST 0102.10-01	All MPEG-2 transport streams or files shall be tagged with security metadata as described by this Standard.
ST 0102.10-02	All metadata shall be expressed in accordance with MISB ST 0107[17].

6.1 Security Metadata Elements

The following Security metadata elements are intended to comprise information needed to comply with CAPCO [1], DoD Information Security Program [3][4][5][6] and other normatively referenced security directives [2]. These normative documents govern which certain fields are mandatory and which fields are optional. Security requirements may dictate some or all entries are mandatory. In all applications the presence or absence of certain metadata will depend on the context of the application and its unique security requirements. Whenever there is conflict between this Standard and directions of Security officials on the required presence or absence of entries the direction of Security officials takes precedence.

6.1.1 Security Classification

The Security Classification metadata element contains a value representing the entire security classification of the file in accordance with U.S. and NATO classification guidance. Values allowed are: TOP SECRET, SECRET, CONFIDENTIAL, RESTRICTED, and UNCLASSIFIED (all caps) followed by a double forward slash “//”. This is a mandatory entry whenever the Security Metadata Sets are used.

Requirement	
ST 0102.10-03	MISP compliant digital Motion Imagery shall contain the Security Classification metadata element.

6.1.2 Classifying Country or Releasing Instructions Country Coding Method

This metadata element identifies the country coding method for the Classifying Country (Par. 6.1.3) and Releasing Instructions (Par. 6.1.6) metadata. The Country Coding Method allows FIPS 10-4 two-letter or four-letter alphabetic country code (legacy systems only); ISO-3166[12][13] two-letter, three-letter, or three-digit numeric; STANAG 1059[18] two-letter or three-letter codes; and GENC two-letter, three-letter or three-digit numeric. GENC administrative subdivision codes are not applicable.

Example of Country Coding Method: **GENC Two Letter**

Requirement	
ST 0102.10-04	MISP compliant digital Motion Imagery shall contain the Classifying Country or Releasing Instructions Country Coding Method metadata element.

6.1.3 Classifying Country

This metadata element contains a value for the classifying country code preceded by a double slash "//".

Example of classifying country: **//CZE (Example of GENC code)**
 //GB (Example of ISO-3166 code)

Requirement	
ST 0102.10-05	MISP compliant digital Motion Imagery shall contain the Classifying Country metadata element.

6.1.4 Sensitive Compartmented Information (SCI) / Special Handling Instructions (SHI)

Requirement	
ST 0102.10-06	When special handling instructions or compartmented information are used, all MISP compliant digital Motion Imagery shall contain the Sensitive Compartmented Information (SCI) / Special Handling Instructions (SHI) metadata element.
ST 0102.10-07	When used, SCI/SHI digraphs, trigraphs, or compartment names shall be added identifying a single or a combination of special handling instructions.
ST 0102.10-08	A single entry shall be ended with a double forward slash "//".
ST 0102.10-09	Multiple digraphs, trigraphs, or compartment names shall be separated by a single forward slash "/".
ST 0102.10-10	Multiple digraphs, trigraphs, or compartment names shall be ended with a double forward slash "//".
ST 0102.10-11	Multiple SCI/SHI digraphs, trigraphs, or compartment names shall be concatenated in one metadata element free text [21] entry.
ST 0102.10-12	The Sensitive Compartmented Information (SCI) / Special Handling Instructions (SHI) metadata element shall only be present when the material in the transport stream or file requires special handling.

6.1.5 Caveats

This metadata element set contains a value representing all pertinent caveats (or code words) from each category of the appropriate security entity register. Entries in this field may be abbreviated or spelled out as free text [21] entries.

Requirement	
ST 0102.10-13	When caveats or code words are used, all MISP compliant digital Motion Imagery shall contain the Caveats metadata element.
ST 0102.10-14	The Caveats metadata element shall be used to indicate FOR OFFICIAL USE ONLY (FOUO) data.

6.1.6 Releasing Instructions

This metadata element contains a list of country codes to indicate the countries to which information in a digital Motion Imagery file is releasable.

Requirement	
ST 0102.10-15	When releasing instructions are used, all MISP-compliant digital Motion Imagery shall contain the Releasing Instructions metadata element.
ST 0102.10-16	Multiple country codes shall be separated by a blank (space – NOT underscore).
ST 0102.10-17	Multiple country codes shall be concatenated in one Releasing Instructions metadata element.

The use of blank spaces to separate country codes, instead of semi-colons or other characters, is to comply with security guidelines and to allow parsing of fields by automated security screening systems. Various countries and international organizations have differing requirements regarding the proper encoding of releasing instructions. Systems must follow the security guidelines appropriate to their mission.

Requirement	
ST 0102.11-63	Systems shall populate the country codes in the Releasing Instructions metadata element according to the security guidelines (national or international) appropriate to their mission.
ST 0102.11-64	U.S. systems shall populate the country codes in the Releasing Instructions metadata element in accordance with DOD Manual 5200.01 Volume 2 [4].

6.1.7 Classified By

This metadata element identifies the name and type of authority used to classify the file. The metadata element is free text [21] and can contain either the original classification authority name and position or personal identifier, or the title of the document or security classification guide used to classify the material.

6.1.8 Derived From

This metadata element contains information about the original source file or document from which the classification was derived. The metadata element is free text [21].

6.1.9 Classification or Marking System

This metadata element identifies the classification or marking system used in this Security Metadata Set as determined by the appropriate security entity for the country originating the data.

Requirement	
ST 0102.10-21	The Classification or Marking System metadata element shall be a free text field.

6.1.10 Classification Reason

This metadata element contains the reason for classification or a citation from a document. The metadata element is free text [21].

6.1.11 Declassification Date

This metadata element provides either a date when the classified material may be automatically declassified.

Requirement	
ST 0102.10-22	The Declassification Date metadata element format shall be YYYYMMDD.

6.1.12 Object Country Coding Method

This metadata element identifies the coding method for the Object Country Code (Par. 6.1.13) metadata. The Object Country Coding Method allows use of FIPS 10-4 two-letter or four-letter alphabetic country code (legacy systems only); ISO-3166 two-letter, three-letter, or three-digit numeric; STANAG 1059 two-letter or three-letter codes; and GENC two-letter, three-letter, three-digit numeric or administrative subdivisions. Use of this element in version 6 of this Standard and later is mandatory. In version 5 and earlier, it was optional; its absence indicates the default GENC two-letter coding method was used in the Object Country Code element. See also Section 6.9.

6.1.13 Object Country Code

This metadata element contains a value identifying the country (or countries), which is the object of the Motion Imagery or metadata in the transport stream or file.

Requirement	
ST 0102.10-23	MISP compliant digital Motion Imagery shall contain the Object Country Code metadata element.
ST 0102.10-24	Multiple object country codes shall be separated by a semi-colon ";" (no spaces).
ST 0102.10-25	Multiple object country codes shall be concatenated in one Object Country Code metadata element entry.
ST 0102.10-26	The object country code of the geographic region lying under the center of the frame shall populate the object country code metadata element.

The Object Country Codes of other represented geographic regions may be included in addition to the country code of the geographic region under the center of frame. Note: The use of the semi-colon to separate country codes, instead of blanks or other characters, is to allow processing by current, automated imagery processing and management tools.

6.1.14 Comments

This metadata element allows for security related comments and format changes necessary in the future. This field may be used in addition to those required by appropriate security entity and is optional.

Requirement	
ST 0102.10-27	The Comments metadata element shall only be used to convey non-essential security related information.

6.1.15 Classifying Country and Releasing Instructions Country Coding Method Version Date

This is the effective date (promulgation date) of the source (FIPS 10-4, ISO 3166, GENC 2.0, or STANAG 1059) used for the Classifying Country and Releasing Instructions Country Coding Method. As ISO 3166 is updated by dated circulars, not by version revision, the ISO 8601 YYYY-MM-DD formatted date is used.

6.1.16 Object Country Coding Method Version Date

This is the effective date (promulgation date) of the source (FIPS 10-4, ISO 3166, GENC 2.0, or STANAG 1059) used for the Object Country Coding Method. As ISO 3166 is updated by dated circulars, not by version revision, the ISO 8601 YYYY-MM-DD formatted date is used.

All remaining security metadata elements are optional unless specific additional requirements are levied on a system. If a system is required to implement any of the additional security metadata elements in this standard, they shall be implemented as described by this standard. Implementations are always encouraged to include as complete a security metadata set as possible.

6.2 Security Metadata Universal Set

The individual metadata elements comprise information needed to identify the security classification of MPEG-2 streams and files and other metadata are defined as SMPTE KLV metadata elements in SMPTE RP 210 [9] and the MISB Metadata Registry [10].

Requirement	
ST 0102.10-28	The Security Metadata Universal Set 16-byte Universal Label Key shall be 06 0E 2B 34 02 01 01 01 02 08 02 00 00 00 00 00 (CRC 31942).
ST 0102.10-29	Required security and linking information shall be contained entirely within a Security Metadata Universal Set that conforms to SMPTE ST 336[7] KLV Universal Set encoding rules.

6.3 Security Metadata Local Set

The individual metadata elements that comprise information needed to identify the security classification of MPEG-2 streams and files and other metadata are defined as SMPTE KLV metadata elements in [9] and [10].

Requirement	
ST 0102.10-30	The Security Metadata Local Set 16-byte Universal Label Key shall be 06 0E 2B 34 02 03 01 01 0E 01 03 03 02 00 00 00 (CRC 40980).
ST 0102.10-31	Required security and linking information shall be contained entirely within a Security Metadata Local Set that conforms to SMPTE ST 336 [7] KLV Local Set encoding rules.

Comment for version Standard 0102.5: In creating the key for the Security Metadata Local Set in version RP 0102.4, it was necessary to use the DRAFT of SMPTE RP 336M-2007. That draft contained ambiguous information, which led to the incorrect assignment of bytes five and six in the Security Metadata Local Set. The final version of SMPTE RP 336 removed the ambiguity and it became apparent the Security Metadata Local Set Key needed to be updated.

6.4 Security Metadata Universal and Local Set Application in MPEG-2 Streams

Security metadata Universal and Local Sets are required to be associated with the essence or metadata they describe. It is possible different portions of an MPEG-2 transport stream or file may have different classification levels. The security metadata may be linked to the essence or metadata using one of the following methods. The method selected is a system design decision. However, implementers should carefully consider their system needs given all methods are not appropriate in all circumstances.

6.4.1 Metadata Links within MPEG-2 Streams and MXF-based Files

Any KLV metadata conforming to SMPTE ST 336 (whether individual metadata, sets, or packs) may be linked to MXF-based files [19] and MPEG-2 elementary stream (ES) within Transport Stream (TS) or Program Stream (PS) formats using the following unique MPEG-2 stream identifiers.

6.4.1.1 Unique Material Identifier (UMID)

SMPTE ST 330[8] defines a UMID used to uniquely identify essence. A 32 byte and 64 byte version UMID are defined. This Standard allows the 32 byte UMID to identify a Motion Imagery or metadata stream and associate a security metadata set with the Motion Imagery or metadata stream. Within the 32 byte UMID, 16 bytes are reserved for a “material number” and three bytes are reserved for an “instance number” (see [9]). The material number must be unique and is associated with a given type of Motion Imagery, audio, or metadata essence; its value is left up to the implementation. The instance number is used to denote different representations of the essence.

Application of UMIDs requires the use of a file wrapper associating the UMID to the specific essence or metadata. Within the suite of MISB Standards, the MXF-based file wrappers currently provide this functionality [19].

Requirement	
ST 0102.10-32	When used, the 32-byte Unique Material Identifier (UMID) defined by SMPTE ST 330 [8] shall identify the essence to which security metadata is linked.

6.4.1.2 Stream ID

In MPEG-2 Program Streams and Packetized Elementary Streams (PES) the 8-bit `stream_id` specifies the type and number of the Elementary Stream. In MPEG-2 Transport Streams the `stream_id` may be set by the user to any valid value which correctly describes the Elementary Stream type (see ISO/IEC 13818-1[11], par 2.4.3.7 and Table 2-18).

Requirement	
ST 0102.10-33	When used, the <code>stream_id</code> shall be the value for the Stream ID metadata element.
ST 0102.10-34	When used, the <code>stream_id</code> shall link the security metadata to the corresponding elementary stream essence.

6.4.1.3 Transport Stream ID

When multiple Transport Streams are present in a network environment the 16-bit `transport_stream_id` uniquely identifies a specific Transport Stream from any other Transport Stream to remove any ambiguity. Its value is defined by the originator (see ISO/IEC 13818-1[11], par 2.4.4.5.).

Requirement	
ST 0102.10-35	When used, the <code>transport_stream_id</code> shall be the Value for the Transport Stream ID.

6.4.1.4 Universal Label Key ID

Linking security metadata to specific metadata elements, sets and packs is best accomplished by linking to the Universal key associated with the value, set or pack.

Requirement	
ST 0102.10-36	When used, the 16-byte Universal Label Key for the element, set or pack to which the Security Metadata Set is linked shall be the value of the Universal Label Key ID.

6.4.2 Linking Security Metadata to MPEG-2 Streams and Files

Requirement	
ST 0102.10-37	When indicating the security classification of individual MPEG-2 streams, files or MXF-based files, the appropriate link metadata elements shall be contained within a Security Metadata Set.

6.4.2.1 Elementary Streams

Use of stand-alone ES formats outside of an MPEG-2 TS or PS is discouraged for the reasons cited in the MISB ST 1402 [20]. Elementary streams may be carried in MXF-based files. However, each Elementary Stream within a Transport Stream, Program Stream or MXF-based file may be associated with a valid Metadata Security Set by containing the one or more UMID or Stream ID metadata elements for the streams to which they apply.

Requirement	
ST 0102.10-38	When the same Security Metadata Set applies to multiple Elementary Streams, the Security Metadata Set shall contain each of the UMIDs or Stream IDs separately in the Security Set.

6.4.2.2 Transport Streams

Each Transport Stream may be associated with a valid Metadata Security Set by containing the UMID or Transport Stream ID metadata element for the Transport Stream.

Requirement	
ST 0102.10-39	The Security Metadata Sets for the Transport Stream shall convey all the security information for the highest classification Elementary Stream or metadata contained in the Transport Stream.

6.4.2.3 Program Streams

Requirement	
ST 0102.10-40	The UMID or stream_id shall be used for directly linking Security metadata to referenced Program Streams in their entirety.
ST 0102.10-41	The Security Metadata Sets for the Program Stream shall convey all the security information for the highest classification Elementary Stream or metadata contained in the Program Stream.

6.4.3 Linking Security Metadata to Other Metadata

Requirement	
ST 0102.10-42	To indicate the security classification of individual metadata elements, a collection of metadata elements, or entire metadata streams, the appropriate link metadata elements shall be contained within a Security Metadata Set.
ST 0102.10-43	When only a single metadata element is associated with a Security Metadata Set, the Security Metadata Set shall contain the Universal Label Key ID the Value of which is the 16-byte Universal Label Key for the single metadata element.
ST 0102.10-44	When a subset of metadata elements within a set or pack is linked to a Security Metadata Set, the Security Metadata Set shall contain each individual Universal Label Key ID for the metadata elements to which it is linked.

ST 0102.10-45	When all metadata in a set or pack is associated with a Security Metadata Set, the set or pack shall contain the Security Metadata Set with a Universal Label Key ID whose value is the Universal Label Key for the set or pack.
ST 0102.10-46	When all metadata in an Elementary Stream (ES) is associated with the same Security Metadata Set, the two sets of metadata shall be associated using the methods in Section 6.4.1 of MISB ST 0102.10.
ST 0102.10-47	When links are not used in the Security Metadata Set, all the security information shall be considered to apply to all the essence and metadata in the MPEG-2 Transport Stream, MPEG-2 Program Stream, or file.
ST 0102.10-48	When essence or metadata linkages are not made within a Security Metadata Universal or Local Set, the Security Metadata shall apply to all essence and metadata in the MPEG-2 stream or file.

6.4.4 Security Metadata Universal and Local Set Repetition Rate

Requirement	
ST 0102.10-49	Security Metadata Sets shall be repeated / updated whenever classification, special handling instructions, releasability, or other mandatory fields change value.
ST 0102.10-50	Security Metadata Sets shall be repeated at regular intervals to enhance random access to streams and files.

Applications producing very short Motion Imagery clips or segments of a few seconds in duration may need to repeat Security Metadata Sets as often as every frame.

6.4.5 Unclassified Essence and Metadata

Requirement	
ST 0102.10-51	When essence and/or metadata are entirely unclassified, the Security Metadata Set shall consist of the value "UNCLASSIFIED //" for Security Classification.

Other entries in the Set which limit or clarify the classification are optional.

6.4.6 Partial Security Metadata Universal and Local Sets

For some operational situations or applications not all metadata elements in Section 6.1 may be required. It is the responsibility of the originator and his cognizant Security official to ensure all appropriate security entries are filled in.

6.4.7 Absence of Security Metadata Universal or Local Sets

The proper insertion of Security Metadata Sets into MPEG-2 streams and files and the extraction of Security information is the responsibility of system developers. It is the responsibility of bit stream originators and system developers to incorporate continual checks for Security Metadata Sets in their applications. The absence of Security Metadata Sets does not signify an MPEG-2 stream, associated metadata or a file as Unclassified.

6.5 Version Number

The version number of the Security Metadata Universal and Local Set for Digital Motion Imagery is indicated via the Version Key.

Requirement	
ST 0102.10-52	The Version Number metadata element of the Security Metadata Universal and Local Set for Digital Motion Imagery for MISB RP 0102.4, MISB ST 0102.5, and later versions shall be required.
ST 0102.10-53	MISB RP 0102.3 shall be assumed for the Version Number metadata element in the absence of MISB RP 0102.5, MISB ST 0102.5 or a later version of MISB ST 0102.
ST 0102.10-54	Unclassified essence and metadata shall be marked with Security Metadata.
ST 0102.10-55	All essence and metadata shall be marked at their proper classification level with appropriate handling, caveats and releasing instructions.
ST 0102.10-56	The Security Metadata Version Number shall be included in all Security Metadata Universal and Local Sets utilizing version four (4) of the Security Metadata or later.
ST 0102.10-57	When the Security Metadata Version Number is not found in the Security Metadata, Version three (3) shall be assumed.

6.6 Summary of Security Metadata Universal Set Elements

Metadata elements allowed in a Security Metadata Universal Set are summarized in Table 1. SMPTE ST 335 [23] defines the length values of metadata items as “*stated*” as opposed to “*normative*”. Certain data types may have a flexible length. The value within the Length column in Table 1 specifies either a fixed or “Variable” number of bytes. When the value is “Variable”, the length is determined by parsing the encoded BER length as specified in the KLV packet.

Table 1: Security Metadata Universal Set Elements

16-byte UL	Name	Data Type or References	Allowed Values or References	Length (Bytes)	Required/ Optional/ Context
06 0E 2B 34 01 01 01 03 02 08 02 01 00 00 00 00 (CRC 5487)	Security Classification	ISO/IEC 646[21] Enumerated Text	TOP SECRET// SECRET// CONFIDENTIAL// RESTRICTED// UNCLASSIFIED//	Variable	Required

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16-byte UL	Name	Data Type or References	Allowed Values or References	Length (Bytes)	Required/Optional/Context
06 0E 2B 34 01 01 01 03 07 01 20 01 02 07 00 00 (CRC 41133)	Classifying Country and Releasing Instructions Country Coding Method	ISO/IEC 646[21] Enumerated Text	ISO-3166 Two Letter ISO-3166 Three Letter ISO-3166 Numeric FIPS 10-4 Two Letter FIPS 10-4 Four Letter 1059 Two Letter 1059 Three Letter GENC Two Letter GENC Three Letter GENC Numeric FIPS 10-4 Mixed ISO 3166 Mixed STANAG 1059 Mixed GENC Mixed	Variable	Required
06 0E 2B 34 01 01 01 03 07 01 20 01 02 08 00 00 (CRC 35996)	Classifying Country	ISO/IEC 646[21] Enumerated Text from the appropriate standard preceded by '/'	FIPS 10-4[14] ISO-3166[12][13] GENC[15] STANAG 1059[18]	Variable	Required
06 0E 2B 34 01 01 01 01 0E 01 02 03 02 00 00 00 (CRC 16536)	Security-SCI/SHI Information	ISO/IEC 646[21]	Security Ref [1]	Variable	Context
06 0E 2B 34 01 01 01 03 02 08 02 02 00 00 00 00 (CRC 64445)	Caveats	ISO/IEC 646[21]	Security Ref [1]	Variable	Context
06 0E 2B 34 01 01 01 03 07 01 20 01 02 09 00 00 (CRC 48044)	Releasing Instructions	ISO/IEC 646[21]	Security Refs [1][24]-[29], [31]	Variable	Context

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16-byte UL	Name	Data Type or References	Allowed Values or References	Length (Bytes)	Required/ Optional/ Context
06 0E 2B 34 01 01 01 03 02 08 02 03 00 00 00 00 (CRC 20972)	Classified By	ISO/IEC 646[21]	Security Refs[1][29]	Variable	Context
06 0E 2B 34 01 01 01 03 02 08 02 06 00 00 00 00 (CRC 29371)	Derived From	ISO/IEC 646[21]	Security Refs [1][29]	Variable	Context
06 0E 2B 34 01 01 01 03 02 08 02 04 00 00 00 00 (CRC 13880)	Classification Reason	ISO/IEC 646[21]	Security Refs [1][29]	Variable	Context
06 0E 2B 34 01 01 01 03 02 08 02 05 00 00 00 00 (CRC 40041)	Declassification Date	ISO/IEC 646[21]	YYYYMMDD	8	Context
06 0E 2B 34 01 01 01 03 02 08 02 08 00 00 00 00 (CRC 48403)	Classification and Marking System	ISO/IEC 646[21]	N/A	Variable	Context
06 0E 2B 34 01 01 01 03 07 01 20 01 02 06 00 00 (CRC 38813)	Object Country Coding Method	ISO/IEC 646[21] Enumerated Text	ISO-3166 Two Letter ISO-3166 Three Letter ISO-3166 Numeric FIPS 10-4 Two Letter FIPS 10-4 Four Letter 1059 Two Letter 1059 Three Letter GENC Two Letter GENC Three Letter GENC Numeric GENC AdminSub	Variable	Required
06 0E 2B 34 01 01 01 03 07 01 20 01 02 01 01 00 (CRC 8508)	Object Country Codes	RFC 2781 [22]	Refs [8][12][13][16]	Variable	Required
06 0E 2B 34 01 01 01 03 02 08 02 07 00 00 00 00 (CRC 55530)	Classification Comments	ISO/IEC 646[21]	N/A	Variable	Optional

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16-byte UL	Name	Data Type or References	Allowed Values or References	Length (Bytes)	Required/ Optional/ Context
06 0A 2B 34 01 01 01 01 01 01 ZZ XY 00 00 00 00 (CRC 43587)	UMID	SMPTE RP 210[9]	SMPTE ST 330[8]	32	Context
06 0E 2B 34 01 01 01 03 01 03 04 02 00 00 00 00 (CRC 62726)	Stream ID	Unsigned Integer	ISO/IEC 13818-1[11]	1	Context
06 0E 2B 34 01 01 01 03 01 03 04 03 00 00 00 00 (CRC 24407)	Transport Stream ID	Unsigned Integer	ISO/IEC 13818-1[11]	2	Context
06 0E 2B 34 01 01 01 03 01 03 06 01 00 00 00 00 (CRC 37012)	Item Designator ID (16 byte)	SMPTE ST 336[7]	SMPTE ST 336[7]	16	Context
06 0E 2B 34 01 01 01 01 0E 01 02 05 04 00 00 00 (CRC 43652)	Version	UInt16	Value is version number of this document; <i>e. g.</i> for STD 0102.10, this value is 0x000A	2	Required
06 0E 2B 34 01 01 01 01 0E 01 04 03 03 00 00 00 (CRC 48077)	Classifying Country and Releasing Instructions Country Coding Method Version Date	ISO/IEC 646[21]	YYYY-MM-DD	10	Optional
06 0E 2B 34 01 01 01 01 0E 01 04 03 04 00 00 00 (CRC 60128)	Object Country Coding Method Version Date	ISO/IEC 646[21]	YYYY-MM-DD	10	Optional

Note: ZZ indicates UMID type see [5]. Allowed values are (05, 06, 08, 09, 0B, 0C, 0D, 0F). XY = 10, 11, 12, 20, 21, or 22.

6.7 Summary of Security Metadata Local Set Elements

Metadata elements allowed in a Security Metadata Local Set are summarized in Table 2.

Table 2: Security Metadata Local Set Elements

Tag	Name	Data Type or References	Allowed Values or References	Length (Bytes)	Required/Optional/Context
1	Security Classification	Unsigned Integer	UNCLASSIFIED// (0x01) RESTRICTED// (0x02) CONFIDENTIAL// (0x03) SECRET// (0x04) TOP SECRET// (0x05)	1	Required
2	Classifying Country and Releasing Instructions Country Coding Method	Unsigned Integer	ISO-3166 Two Letter (0x01) ISO-3166 Three Letter (0x02) FIPS 10-4 Two Letter (0x03) FIPS 10-4 Four Letter (0x04) ISO-3166 Numeric (0x05) 1059 Two Letter (0x06) 1059 Three Letter (0x07) <i>Omitted Value</i> (0x08) <i>Omitted Value</i> (0x09) FIPS 10-4 Mixed (0x0A) ISO 3166 Mixed (0x0B) STANAG 1059 Mixed (0x0C) GENC Two Letter (0x0D) GENC Three Letter (0x0E) GENC Numeric (0x0F) GENC Mixed (0x10)	1	Required
3	Classifying Country	Enumerated Text from the appropriate standard preceded by ‘//’	FIPS 10-4[14] ISO-3166[12][13] STANAG 1059[18] GENC[15]	Variable	Required
4	Security-SCI/SHI information	ISO/IEC 646[21]	Security Ref [1]	Variable	Context
5	Caveats	ISO/IEC 646[21]	Security Ref [1]	Variable	Context
6	Releasing Instructions	ISO/IEC 646[21]	Security Ref [1][22][24]-[28] [30]	Variable	Context
7	Classified By	ISO/IEC 646[21]	Security Refs [1][27]	Variable	Context
8	Derived From	ISO/IEC 646[21]	Security Refs [1] [27]	Variable	Context
9	Classification Reason	ISO/IEC 646[21]	Security Refs [1][27]	Variable	Context
10	Declassification Date	ISO/IEC 646[21]	YYYYMMDD	8	Context

Tag	Name	Data Type or References	Allowed Values or References	Length (Bytes)	Required/ Optional/ Context
11	Classification and Marking System	ISO/IEC 646[21]	N/A	Variable	Context
12	Object Country Coding Method	Unsigned Integer	ISO-3166 Two Letter (0x01) ISO-3166 Three Letter (0x02) ISO-3166 Numeric (0x03) FIPS 10-4 Two Letter (0x04) FIPS 10-4 Four Letter (0x05) 1059 Two Letter (0x06) 1059 Three Letter (0x07) <i>Omitted Value</i> (0x08) <i>Omitted Value</i> (0x09) <i>Omitted Value</i> (0x0A) <i>Omitted Value</i> (0x0B) <i>Omitted Value</i> (0x0C) GENC Two Letter (0x0D) GENC Three Letter (0x0E) GENC Numeric (0x0F) GENC AdminSub (0x40)	1	Required
13	Object Country Codes	RFC 2781[22]	Refs [8][12][13][15]	Variable	Required
14	Classification Comments	ISO/IEC 646[21]	N/A	Variable	Optional
15	UMID	SMPTE RP210[9]	SMPTE ST 330[8]	32	Context
19	Stream ID	Unsigned Integer	ISO/IEC 13818-1[11]	1	Context
20	Transport Stream ID	Unsigned Integer	ISO/IEC 13818-1[11]	2	Context
21	Item Designator ID (16 byte)	SMPTE ST 336[7]	SMPTE ST 336[7]	16	Context
22	Version	UInt16	Value is version number of this document; e. g. for STD 0102.10, this value is 0x000A	2	Required
23	Classifying Country and Releasing Instructions Country Coding Method Version Date	ISO/IEC 646[21]	YYYY-MM-DD	10	Optional
24	Object Country Coding Method Version Date	ISO/IEC 646[21]	YYYY-MM-DD	10	Optional

6.8 Conversion of Security Metadata Elements between Universal and Local Sets

For bandwidth efficiency, some elements in the Local Set are formatted differently than the Universal Set equivalent. This section provides conversion information for the differing items.

6.8.1 Security Classification

From Universal Set to Local Set:

Convert string to unsigned integer.

From Local Set to Universal Set:

Convert unsigned integer to all uppercase string.

6.8.2 Classifying Country and Releasing Instructions Country Code

From Universal Set to Local Set:

Convert string to unsigned integer.

From Local Set to Universal Set:

Convert unsigned integer to all uppercase string.

6.8.3 Object Country Coding Method

From Universal Set to Local Set:

Convert string to unsigned integer.

From Local Set to Universal Set:

Convert unsigned integer to all uppercase string.

6.9 “Mixed” Country Coding Method

The CAPCO Authorized Classification and Control Marking Register Annex F is the approved source of (coalition and other multi-national organization) tetragraphs.

Requirement	
ST 0102.10-58	The Mixed Country Coding Method shall be used to support di- or tri-graphs (but not both) from FIPS 10-4, ISO 3166, GENC and STANAG 1059, respectively, and approved tetragraphs in the same field.

For example, a Tag 2 value of “0C” would indicated the payload of Tag 6 consists of STANAG 1059 di-graphs or tri-graphs (but not both) and one or more tetragraphs from the CAPCO Authorized Classification and Control Marking Register.

CAPCO requires document header/footer and portion mark classification country codes be ISO 3166 trigraphs.

6.10 Geopolitical Entities, Names, and Codes (GENC) Standard

The FIPS 10-4[14] standard has been retired for use by all U.S. government agencies, services and commands by the Department of State. The GENC standard [15] was created to replace FIPS 10-4 and is based on ISO-3166[12][13]. A memorandum from the DoD Executive Agent for Information Technology Standards [16] has mandated the use of GENC and ISO-3166 for all country code uses in U.S. DoD information systems. New systems undergoing acquisition or block upgrades are expected to comply with GENC by December 2014.

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The GENC standard is a profile of ISO-3166 and uses the codes out of ISO-3166-1 and ISO-3166-2. ISO-3166-1 defines country codes and ISO-3166-2 adds codes for administrative subdivisions (*e.g.* states, provinces, etc.). The GENC interpretation of these codes does differ from the ISO standard. Many times the differences are subtle and related to the proper names or shorthand names of countries. Other times the differences are more significant. GENC adds additional codes and disallows others from the ISO standards. The NSG registry has established a website describing the content of GENC, and it is the definitive standard for GENC.

U.S. Agencies, Commands and Services are required to use GENC and ISO-3166 in their systems. For backwards compatibility only, this Standard allows usage of FIPS 10-4 within legacy systems producing Motion Imagery.

Requirement	
ST 0102.10-59	Current and future U.S. systems producing digital Motion Imagery shall adhere to guidance as directed by the Memorandum for Department of Defense Executive Agent for Information Technology Standards, Subject: Mandating the Use of Country Code Standards within the Department of Defense [16] for GENC and ISO-3166 country codes.
ST 0102.10-60	All current systems that do not use GENC or ISO-3166 shall use country codes as defined in GENC and ISO-3166 at their next block upgrade.
ST 0102.10-61	All current systems that consume digital Motion Imagery shall understand and properly interpret all country coding methods except for GENC Administrative Subdivisions (GENC AdminSub) code.
ST 0102.10-62	All current systems that consume digital Motion Imagery shall understand and properly interpret at least the country code portion of a GENC Administrative Subdivisions (GENC AdSub) code.

Appendix A Deprecated Requirements

Requirement	
ST 0102.10-18	For U.S. systems, the country code of the originating country shall appear first as required by DOD Manual 5200.01 Volume 2 [4].
ST 0102.10-19	After the country code of the originating country the country codes of other countries to which the data are releasable shall appear in alphabetical order.
ST 0102.10-20	After the country codes of other countries the codes of any non-state organizations (such as NATO) to which the data are releasable shall appear in alphabetical order.